LINQ™

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Ethernet/Network Communications Module

Installation and Programming Manual

LINQ2

- Two (2) Port Connectivity Module

DOC#: LINQ2

Rev. 060514

Altronix®

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Overview:

Altronix LINQ2 network module is designed to interface with eFlow and MaximalF power supply/chargers. It enables power supply status monitoring and control of two (2) eFlow power supply/chargers over a LAN/WAN or USB connection. LINQ2 provides values on demand for AC fault status, DC current and voltage, as well as Battery fault status, and reports conditions via SNMP. The LINQ2 can also be used as a standalone network controlled relay powered from any 12VDC to 24VDC power supply.

Features:

- Management interface for up to two (2) eFlow power supply/chargers.
- Real time status of DC output voltage, output current, AC and Battery status and enclosure temperature.
- Two (2) network controlled Form "C" relays.
- Local and remote control of DC power outputs.
- Battery service date indication.
- SNMP trap message notifications (instant and delayed).
- Connect up to five (5) local or remote trap receivers.
- E-mail notification selectable by event.
- Event log tracks history.
- Programmable via USB or web browser.
- Management interface software included (USB flash drive).
- Includes interface cables and mounting bracket.

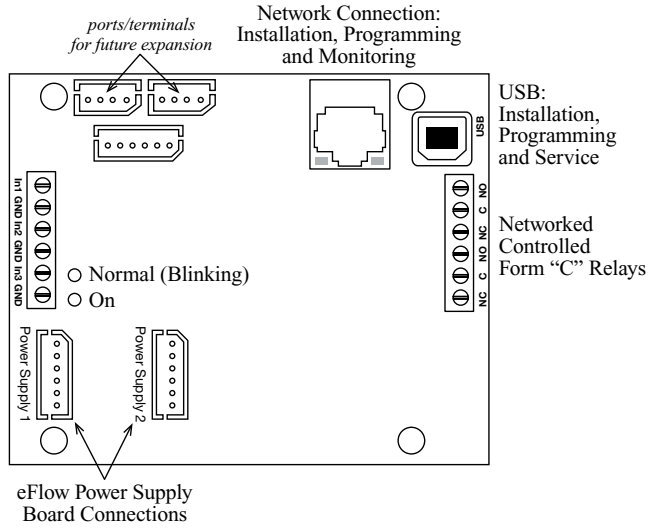
Status Monitoring:

- AC status.
- Output current draw.
- Unit's temperature.
- DC output voltage.
- Low Battery/Battery presence detection.

Installing LINQ2 Board:

1. Using the mounting bracket mount the LINQ2 network module to the desired location on the enclosure. Secure the module by tightening the screws on the front edge of the mounting bracket *(Fig. 2, pg. 3)*.
2. Connect one end of the supplied interface cable(s) to the ports marked [Power Supply 1] and [Power Supply 2] on LINQ2 *(Fig. 1, pg. 2)*. When connecting to one power supply use the connector marked [Power Supply 1].
3. Connect the other end of the interface cable to the interface port of each eFlow power supply board.
4. Connect Ethernet cable (CAT5e or higher) to the RJ45 jack on the LINQ2 network module.
5. Refer to the programming section of this manual to setup the LINQ2 network module for proper operation.

Fig. 1



LED Diagnostics:

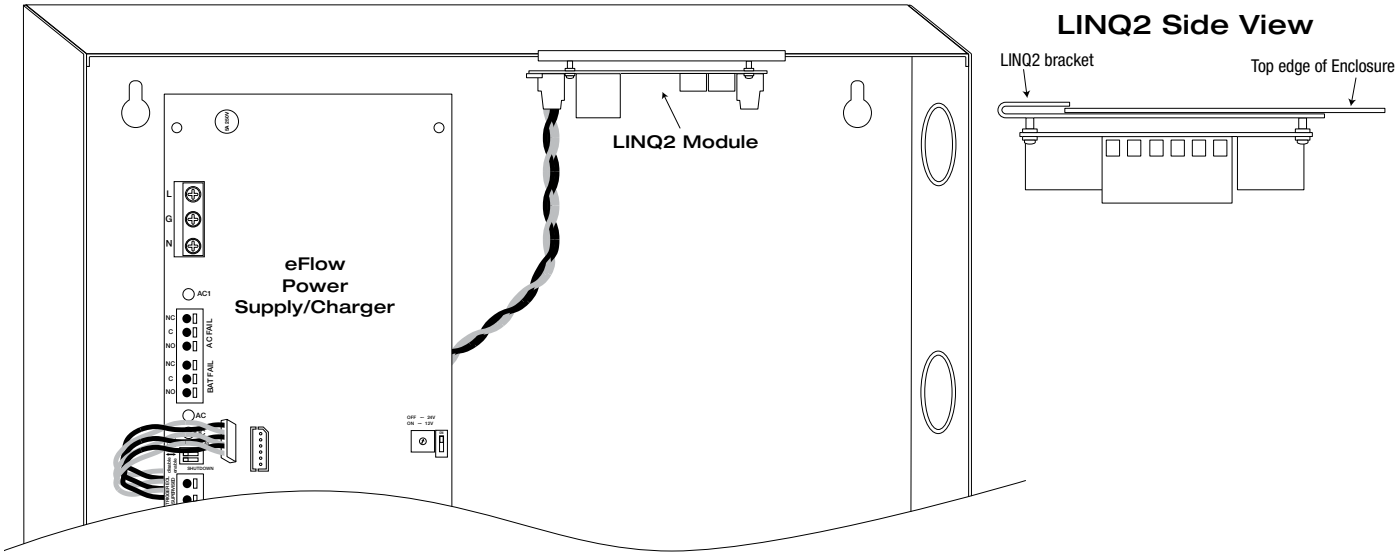
LED	Color	State	Status
1	BLUE	ON/STEADY	Power
2	BLUE	BLINKING	Normal operating condition
3	N/A		
4	N/A		

Terminal Identification:

Terminal/Legend	Description
Power Supply 1	Interfaces with first eFlow Power Supply/Charger
Power Supply 2	Interfaces with second eFlow Power Supply/Charger
RJ45	Ethernet: LAN or laptop connection enables LINQ2 programming and status monitoring
USB	Laptop connection enables LINQ2 programming

LINQ2 Installed Inside the eFlow Enclosure:

Fig. 2



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Network Setup:

Altronix Dashboard USB Connection:

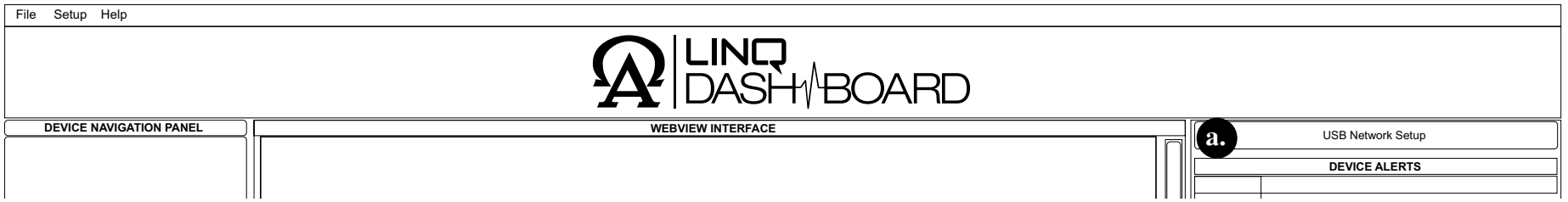
The USB connection on the LINQ2 is used for Network and Trap Receiver configuration only. When connected to a PC via the USB cable the LINQ2 will receive power from the USB port allowing programming of the LINQ2 prior to being connected to the power supply.

1. Install the software supplied with the LINQ2 on the PC being used for programming. This software should be installed on all computers that will have access to the LINQ2.
2. Connect the supplied USB cable to the USB port on the LINQ2 and the computer.
3. Double click on the **Dashboard icon** on the desktop of the computer and open the Dashboard.
4. Click on the button marked **USB Network Setup** in the upper hand side of the dashboard. This will open the USB Network Setup screen. In this screen the MAC Address of the LINQ2 module will be found along with the Network Settings, Trap Receiver Settings and SNMP Port Settings.

1- Network Settings:

In the IP Address Method field select the method by which the IP Address for the LINQ2 will be obtained: **"STATIC"** or **"DHCP",** then follow the appropriate steps.

Fig. 3



STATIC *(Fig. 4a, pg. 4)*:

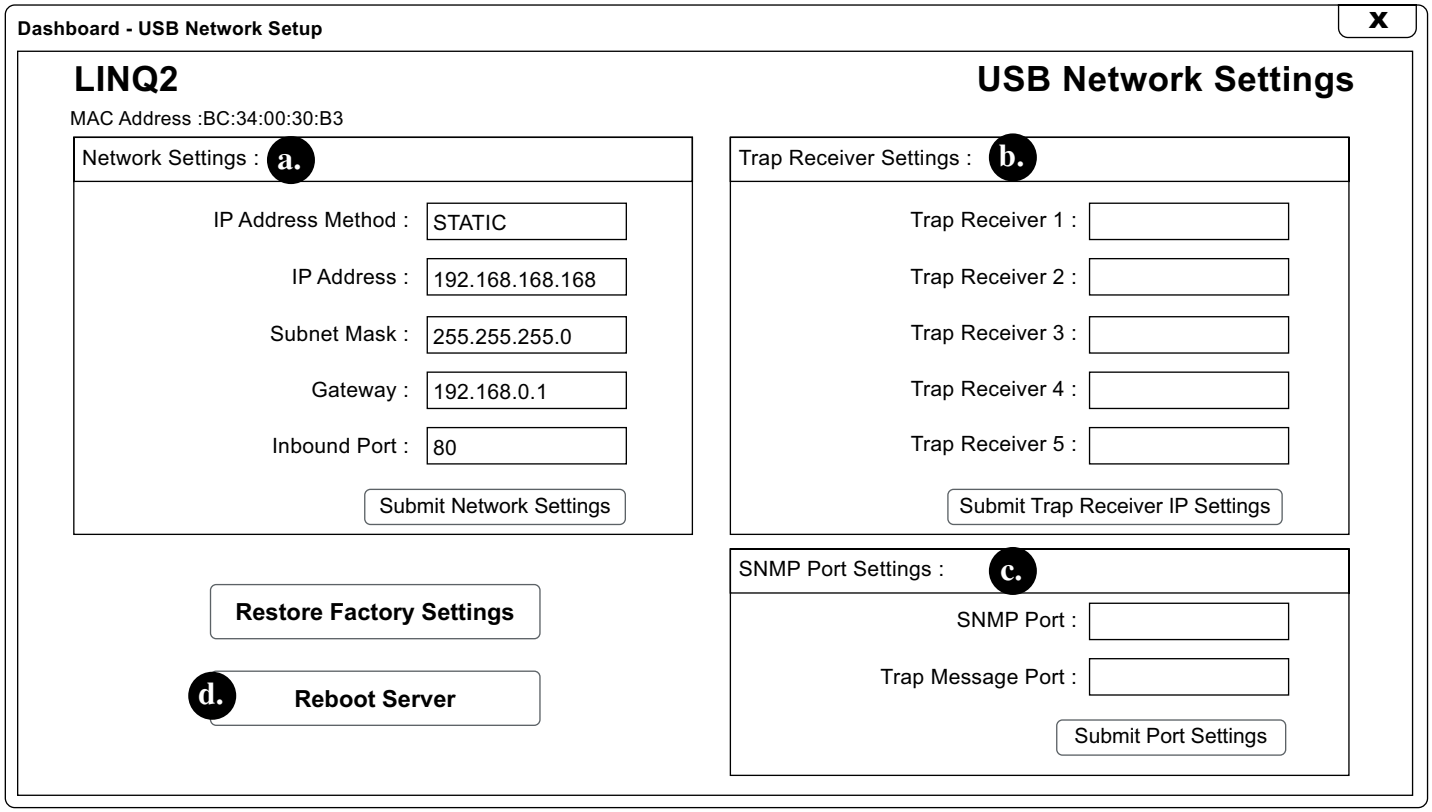
a. IP Address: Enter the IP address assigned to the LINQ2 by the network administrator.
b. Subnet Mask: Enter the Subnet of the network.
c. Gateway: Enter the TCP/IP gateway of the network access point (router) being used.
Note: Gateway configuration is required to properly receive emails from the device.
d. Inbound Port (HTTP): Enter the port number assigned to the LINQ2 module by the network administrator to allow remote access and monitoring.
e. Click the button labeled **Submit Network Settings** a dialog box will display "New network settings will take effect after the server is rebooted" click **OK**.

DHCP *(Fig. 4a, pg. 4)*:

Connect LINQ2 to the DHCP router to obtain IP address.

a. After selecting DHCP in the IP Address Method field click the button labeled **Submit Network Settings.** A dialog box will display "New network settings will take effect after the server is rebooted". Click **OK**. Next click on the button labeled **Reboot Server**. After the LINQ2 reboots the IP address assigned will appear in the IP Address field. It is recommended to have the assigned IP Address reserved on the router to ensure continued access to the LINQ2 *(see the network administrator)*.
b. Subnet Mask: When operating in DHCP the router will assign the subnet mask values.
c. Gateway: Enter the TCP/IP gateway of the network access point (router) being used.
d. Inbound Port (HTTP): Enter the port number assigned to the LINQ2 module by the network administrator to allow remote access and monitoring.
The default inbound port setting is 80.
e. Click the button labeled **Submit Network Settings**. A dialog box will display "New network settings will take effect after the server is rebooted". Click **OK**.

Fig. 4



2- Trap Receiver Settings *(Fig. 4b, pg. 4)***:**

a. Enter up to five SNMP trap receiver IP addresses. When accessing the LINQ2 remotely check with the network administrator for proper configuration.
b. Click the button labeled **Submit Trap Receiver IP Settings**. A dialog box will display "New Trap Receiver IP settings will take effect after the server is rebooted". Click **OK**.

3- SNMP Port Settings *(Fig. 4c, pg. 4)***:**

SNMP uses the default port 161 for general SNMP messages and port 162 for SNMP trap messages. In the event these port(s) need to be changed enter the new port numbers assigned by the network administrator.
Click the button labeled **Submit Port Settings** a dialog box will display "New Port settings will take effect after the server is rebooted" click **OK**.

After all information has been entered click on the button labeled **Reboot Server** *(Fig. 4d, pg. 4)* a dialog box will display
"Please allow up to 30 seconds for the server to reboot". Click **OK**.
After the LINQ2 has been rebooted all programmed information will be saved. Disconnect the USB cable from the LINQ2 module. If the LINQ2 has not been connected to the eFlow power supply(ies) being monitored, *(refer to Installing LINQ2 Board on page 2 of these instructions)*.
Connect one end of the network cable to the network jack on the LINQ2 and the other to the network connection or the PC to be used for programming.
Note: Email notification must be setup via the Browser, refer to Email Settings in the Browser Setup section of this manual.

Browser Setup:

When not using the Altronix Dashboard USB connection for the initial Network setup the LINQ2 needs to be connected to the eFlow power supply(ies) being monitored *(refer to Installing LINQ2 Board on page 2 of these instructions)* prior to programing.
Factory Default settings

- IP Address: 192.168.168.168
- User Name: admin
- Password: admin

1. Set the static IP address for the laptop to be used for programming to the same network IP address as the LINQ2 i.e. 192.168.168.200 (default address of the LINQ2 is 192.168.168.168).
2. Connect one end of the network cable to the network jack on the LINQ2 and the other to the network connection of the laptop.
3. Open a browser on the computer and enter "192.168.168.168" into the address bar. A dialog box Authentication Required will appear requesting both user name and password enter the default values here. Click on the button labeled **Log In**.
4. The status page of the LINQ2 will appear. This page displays the real time status and health of each power supply connected to the LINQ2.

1-Network setup

Click on the tab labeled **Network Settings**. This will open the Network Setting screen. In this screen the MAC Address of the LINQ2 module will be found along with the programming fields for the Network Settings, Trap Receiver Settings, SNMP Port Settings and Email Settings.

Network Settings *(Fig. 5a, pg. 6)***:**

In the IP Address Method field select the method that the IP Address for the LINQ2 will be obtained "Static" or "DHCP" then follow the appropriate steps.

STATIC *(Fig. 5a, pg. 6)***:**

a. IP Address: Enter the IP address assigned to the LINQ2 by the network administrator.
b. Subnet Mask: Enter the Subnet of the network.
c. Gateway: Enter the TCP/IP gateway of the network access point (router) being used.
Note: Gateway configuration is required to properly receive emails from the device.
d. HTTP Port: Enter the HTTP port number assigned to the LINQ2 module by the network administrator to allow remote access and monitoring. The default inbound port setting is 80. HTTP is not encrypted and unsecure. Even though HTTP can be used for remote access it is recommended primarily for use with LAN connections.
e. HTTPS Port: Enter the HTTPS port number assigned to the LINQ2 module by the network administrator to allow remote access and monitoring. The default inbound port setting is 443. Being encrypted and more secure HTTPS is highly recommended for remote access.
f. Click the button labeled **Submit Network Settings**. A dialog box will display "New network settings will take effect after the server is rebooted". Click **OK**.

DHCP *(Fig. 5a, pg. 6)*:

a. After selecting DHCP in the IP Address Method field click the button labeled **Submit Network Settings**. A dialog box will display "New network settings will take effect after the server is rebooted". Click **OK**. Next click on the button labeled **Reboot Server**. After rebooting the LINQ2 will be set in the DHCP mode. The IP address will be assigned by the router when the LINQ2 is connected to the network.
Note: It is recommended to have the assigned IP Address reserved to ensure continued access *(see the network administrator)*.
b. **Subnet Mask:** When operating in DHCP the router will assign the subnet mask values.
c. **Gateway:** TCP/IP gateway of the network access point (router) being used will be displayed.
d. **HTTP Port:** Enter the HTTP port number assigned to the LINQ2 module by the network administrator to allow remote access and monitoring. The default inbound port setting is 80. HTTP is not encrypted and unsecure. Even though HTTP can be used for remote access it is recommended primarily for use with LAN connections.
e. **HTTPS Port:** Enter the HTTPS port number assigned to the LINQ2 module by the network administrator to allow remote access and monitoring. The default inbound port setting is 443. Being encrypted and more secure HTTPS is highly recommended for remote access.
f. Click the button labeled **Submit Network Settings**. A dialog box will display "New network settings will take effect after the server is rebooted". Click **OK**.

Trap Receiver Settings *(Fig. 5b, pg. 6)*:

a. Enter up to five SNMP trap receiver IP addresses. When accessing the LINQ2 remotely check with the network administrator for proper configuration.
b. Click the button labeled **Submit Trap Receiver IP Settings**. A dialog box will display "New Trap Receiver IP settings will take effect after the server is rebooted". Click **OK**.

SNMP Port Settings *(Fig. 5c, pg. 6)*:

SNMP uses the default port 161 for general SNMP messages and port 162 for SNMP trap messages. In the event these ports need to be changed enter the new port numbers assigned by the network administrator.
Click the button labeled **Submit Port Settings**. A dialog box will display "New SNMP port settings will take effect after the server is rebooted". Click **OK**.

Email Settings *(Fig. 5d, pg. 6)*:

The LINQ2 can send emails via an in-house email server, email service provider (i.e. Gmail, Yahoo) or Altronix default email service.

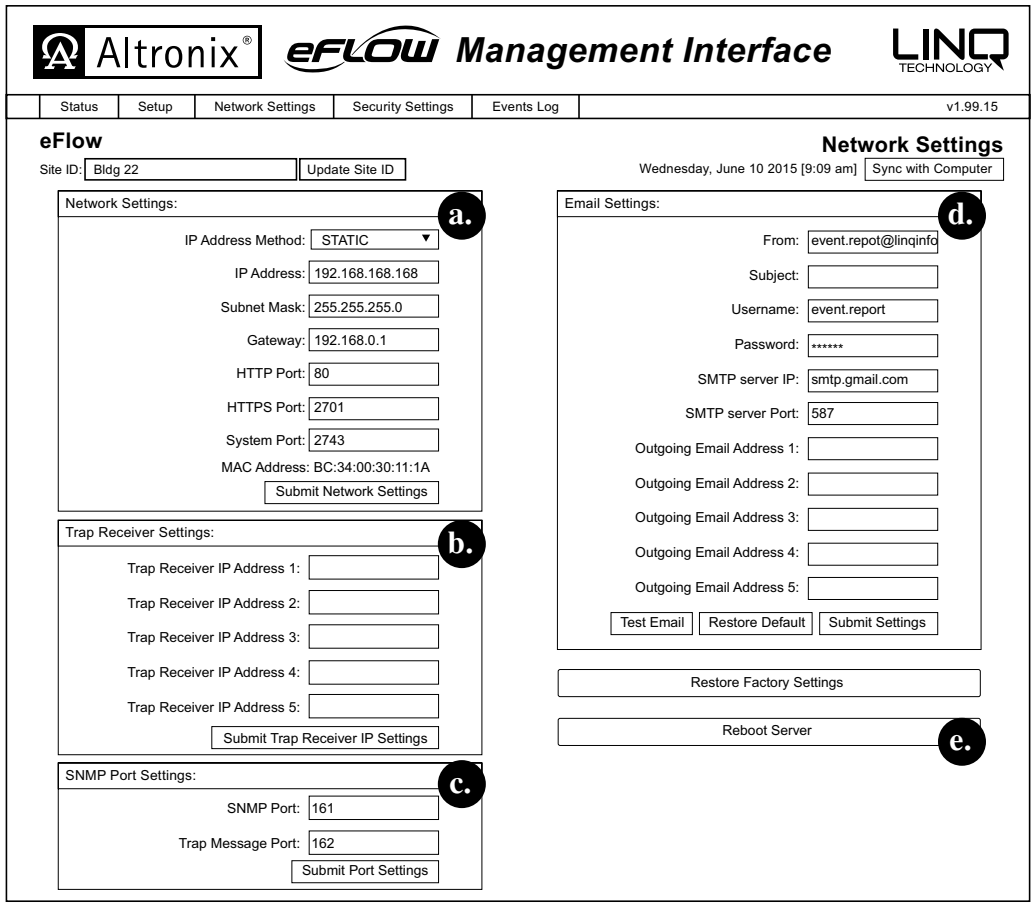
In-house email server:

a. From: Enter the email address assigned to the LINQ2 module by the system administrator.
b. Subject: Identify the location of the LINQ2 (i.e. the Site ID)
c. Username: Enter the username associated with the Linq2 module email address.
d. Password: Enter the username password
e. SMTP server IP: Enter the SMPT IP address of the in-house email server.
f. SMTP server Port: Enter the SMPT port assigned to the in-house email server.
g. Outgoing Email Address 1-5: Enter up to five outgoing email addresses.
h. Click the button labeled **Submit Email Settings** email setting will be saved.

Email service provider *(Fig. 5d, pg. 6)*:

a. From: Enter the email address for the LINQ2 module.
b. Subject: Identify the location of the LINQ2 (i.e. the Site ID)
c. Username: Enter the username associated with the LINQ2 module email address.
d. Password: Enter the username password
e. SMTP server IP: Enter the SMPT IP address of the email service provider.

Fig. 5



f. SMTP server Port: Enter the email SMPT port number. The default SMPT email ports are 25 or 465 unless otherwise specified.
g. Outgoing Email Address 1-5: Enter up to five outgoing email addresses.
h. Click the button labeled **Submit Email Settings** email setting will be saved.

Altronix default email service:
a. All required sender and network fields have already been populated.
b. Outgoing Email Address 1-5: Enter up to five outgoing email addresses.
c. Click the button labeled **Submit Email Settings** email setting will be saved.

To test the email setup click the button labeled **Test Email**. An email will be sent to all Outgoing email addresses. If the test email is not received contact the network administrator and repeat the email setup sets.
After all fields have been programed click the button labeled **Reboot Server** *(Fig. 5e, pg. 6)* a dialog box will display "Please allow up to 30 seconds for server to reboot". Click **OK**. All programmed information will be saved after the server has rebooted.

2- Setup *(Fig. 6, pg. 7)***:**
Note: If the Altronix Dashboard is being used for LINQ2 setup, refer to the Folder and Device configuration section in the Altronix Dashboard setup/user manual.
Click on the tab labeled **Setup**. The LINQ2 setup page will open. This page is used to program the Site ID, the power supply(ies) and relays, along with the ability to turn the individual power supplies and relays ON and OFF. The LINQ2 is capable of simultaneously monitoring two (2) eFlow power supplies.
If only one power supply is to be monitored uncheck the box next to unused power supply.

Site ID *(Fig. 6a, pg. 7)***:** Enter a descriptive name that will identify the location of the LINQ2. The Site ID will appear in both the trap message and email notifications.

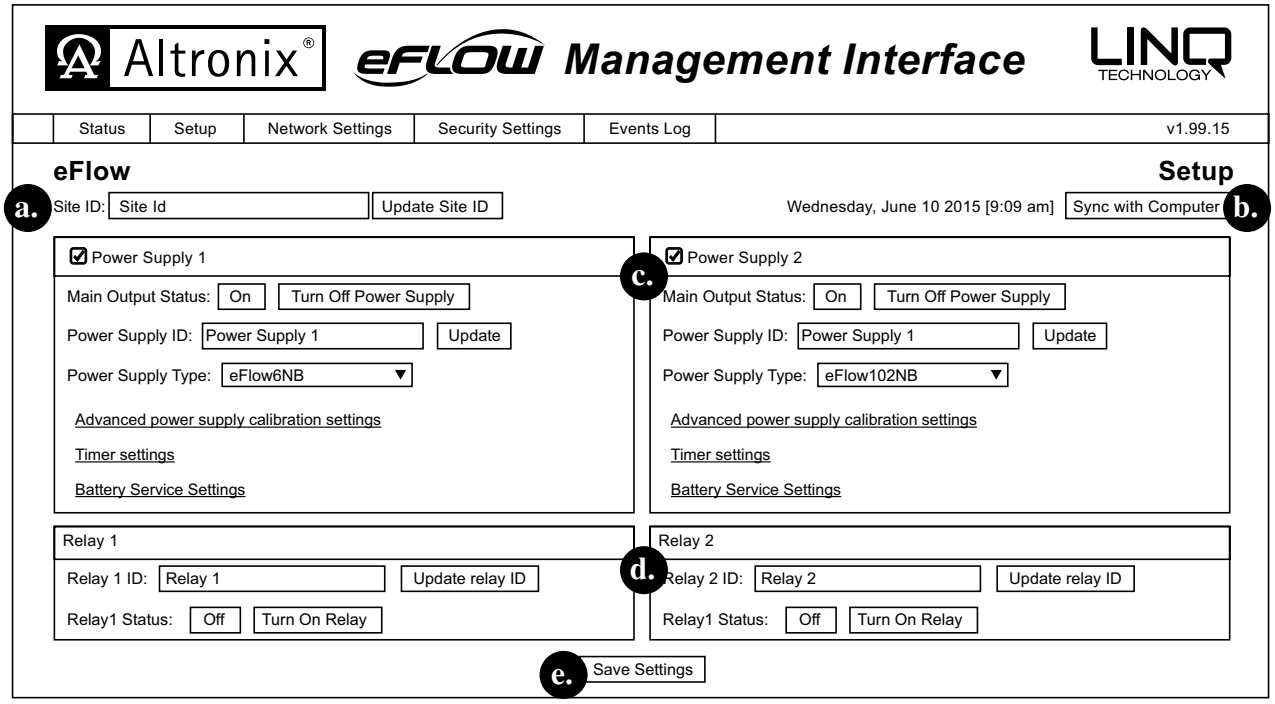
Date/Time *(Fig. 6b, pg. 7)***:** Clicking the button labeled "Sync with Computer" will set the LINQ2 to the time of the host computer.

Power Supply Configuration:
Main Output Status *(Fig. 6c, pg. 7)***:**
Shows the operating state of the power supply ON/OFF. Individual power supplies can be turned ON/OFF by clicking the button labeled **Turn Off Power supply/ Turn ON Power supply**. This feature can be used when servicing devices connected to the power supply or to reboot a connected device by cycling power OFF and ON.

Power Supply ID *(Fig. 6c, pg. 7)***:** Enter a descriptive name and/or location of the connected power supply. Click the button labeled **Update**.

Power Supply Type *(Fig. 6c, pg. 7)***:**
Using the drop down list select the power supply connected to the LINQ2. This will set the default calibration values for the connected power supply.

Fig. 6



Advanced Power Supply Calibration *(Fig. 7a, pg. 8)*:
For greater accuracy the output voltage and current draw values on the main can be measured and manually entered.

- **a.** Click **Advanced Power Supply Calibration Settings** the default output voltage and current values will be displayed.
- **b. Voltage:** Click on the button labeled **Calibrate** accross from Output Voltage. Measure of the main output of the connected power supply and enter the value in the Measured Voltage text box then click the button labeled **Calibrate**. The measured output voltage will now be displayed.
- **c. Current:** After all the devices to be powered are connected to the power supply Click on the button labeled **Calibrate** accross from Output Current. Measure of the draw at the main output of the connected power supply and enter the value in the Measured Current text box then click the button labeled **Calibrate**. The measured output current will now be displayed.

Timer Settings *(Fig. 7b, pg. 8)*:
To avoid unwanted nuisance SNMP trap and email alerts reporting delays can be programmed for AC Fail, Battery Fail and Output faults.

a. Click **Timer Settings** The default delay setting for the AC Timer, Battery Timer and Output Fault Timer will be displayed.
b. The delay times can be set for Days, Hours, Minutes or Seconds. Using the drop down list select the delay time for each AC Fail, Battery Fail and Output faults.

The new changes will not take effect until this button is pressed.

Battery Service Settings *(Fig. 7c, pg. 8)*:
Batteries should be inspected at least once a year. Even though the expected battery life is 5 years, it is recommended changing batteries in 4 years. A battery service date can be set to have the LINQ2 send an SNMP trap and/or email notification that the batteries are due for service. The notification can be programmed to be sent prior to the actual service date to allow for scheduling.

1. Click **Battery Service Settings** the battery service panel will open.
2. Enter the date the battery was installed in the text box **Installation Date:**.
3. Enter the date the battery needs to be services in the text box **Next Service Date:**.
4. Enter the reminder days that the notification will be sent prior to the actual service date.
5. Click the button labeled **Submit**.

These dates should be changed after each battery service.

Relay 1 and Relay 2 *(Fig. 8, pg. 8)*:
Relay1/2 ID:

a. Enter a descriptive name and/or relay function.
b. Click the button labeled **Update relay ID**.

Relay Status: Shows the operating state of the relay ON/OFF.
The individual relays can be turned ON/OFF by clicking the button labeled **Turn On Relay / Turn Off Relay**.
After all fields have been programmed click on the button labeled **Save Setting** *(Fig. 6e, pg. 7)*.

Fig. 7

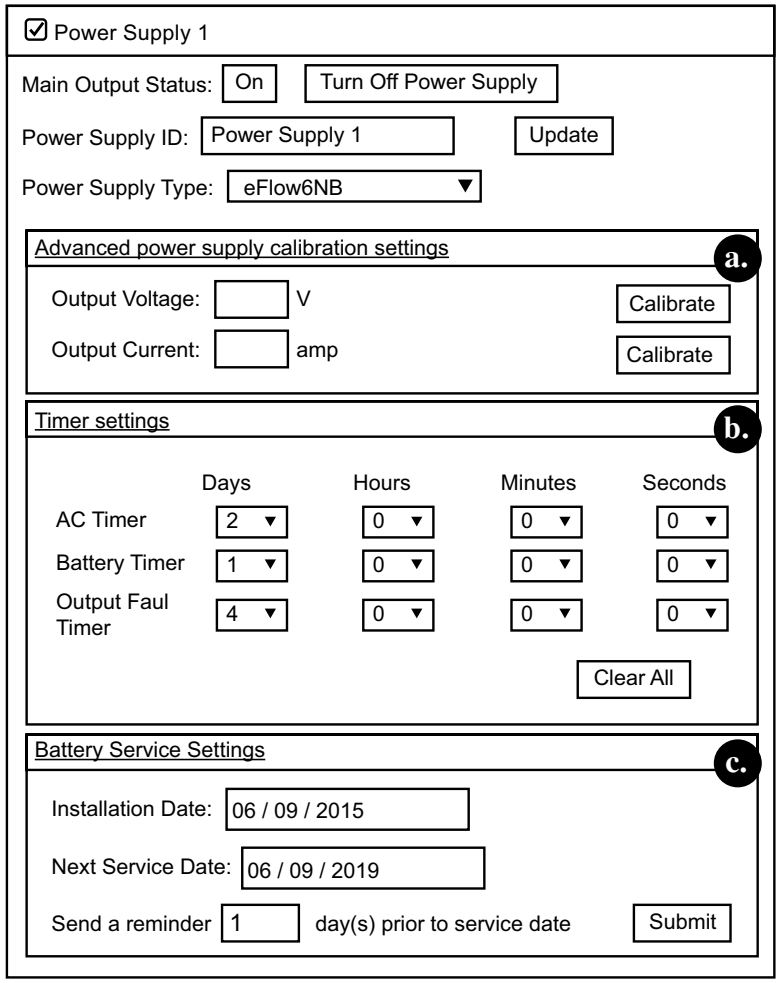
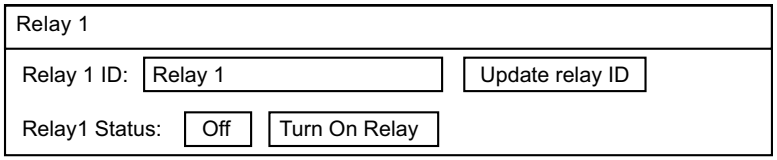


Fig. 8



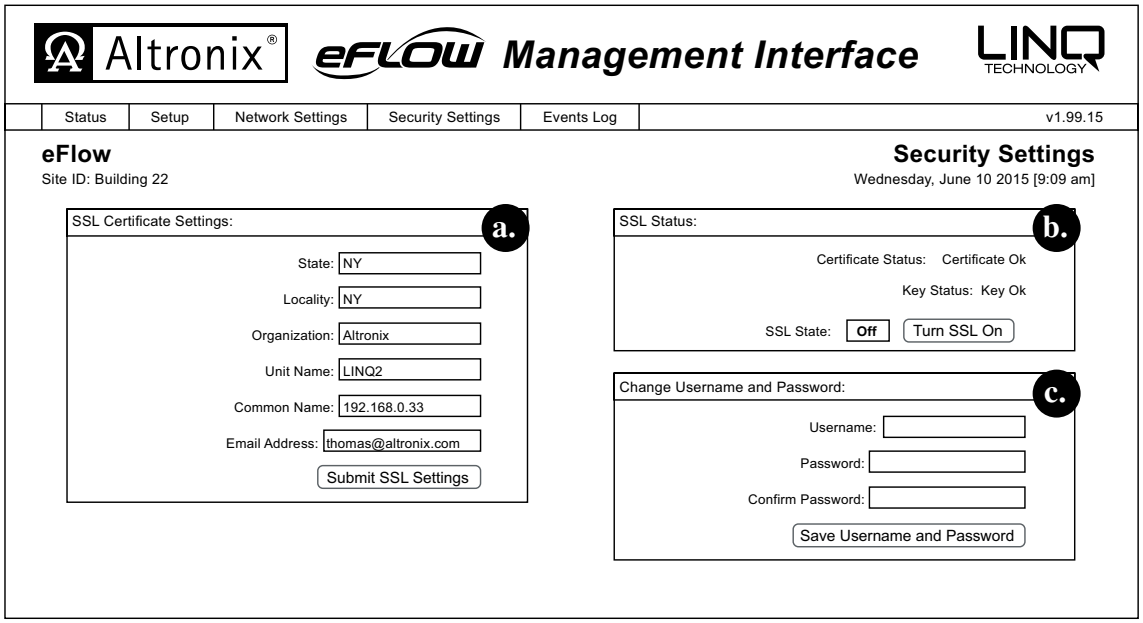
3- Security Settings *(Fig. 9, pg. 9)***:**
Click on the tab labeled **Security Settings**. The LINQ2 security setting page will open. In this screen the SSL Certificate and Key will be entered, the SSL can be enabled or disabled and new username and password can be set.
Using an SSL Certificate will ensure that when remotely accessing the LINQ2 all data has been encrypted and there for secure through the assigned HTTPS Port.

SSL Certificate Setting *(Fig. 9a, pg. 9)***:**
Generating a self-signed SSL Certificate and Key.

a. **State:** Two letter code representing the state where the organization is located.
b. **Location:** The city where the organization is located.
c. **Organization:** The legal name of the organization. This should not be abbreviated, and should include suffixes such as Inc., Corp, or LLC.
d. **Unit Name:** Name of the device.
e. **Common Name:** Domain name or IP address of the server. This is typically assigned by the network administrator.
f. **Email Address:** An email address used to contact the organization.

After all fields have been completed click on the button labeled **Submit SSL Settings** a dialog box will appear "Please allow up to 30 seconds for server to reboot". Click **OK**. A self-signed SSL certificate will be generated with the information provided in the "SSL Certificate Settings" fields. The certificate will be valid for 500 days, and time stamped with the time settings present on the LINQ2 module. The date and time must be synced with the host computer before generating an SSL certificate.

Fig. 9



Using a private SSL certificate and Key:
Private SSL Certificates and Keys must be uploaded using the Altronix Dashboard. For additional information refer to the Altronix Dashboard setup/user manual section Updating firmware / SSL certificate and Key.

SSL Status *(Fig. 9b, pg. 9)***:**

Certificate Status: Certificate OK = Valid SSL Certificate
Bad Certificate = Invalid SSL Certificate
No Certificate = a Valid SSL Certificate has not been loaded.

Key Status: Key OK = Valid SSL Key
Bad Key = Invalid SSL Key
No Key = a Valid SSL Key has not been loaded.

SSL State: The SSL of the LINQ2 can be turned on and off by click the button labeled **Turning SSL On/Turning SSL Off**.

Change Username and Password *(Fig. 9c, pg. 9)***:**

a. **Username:** Enter the new Username (up to 32 characters) required to access the LINQ2.
b. **Password:** Enter the new Password (up to 32 alpha numeric characters) required to access the LINQ2.
c. **Confirm Password:** Re-enter the new Password.

Click the button labeled **Save Username and Password**. A dialog box will appear, "New settings have been applied". Click **OK**.
After saving, the new username and password, it will be activated.

4- Event Log and Heart Beat Timer *(Fig. 10, pg. 10)*:
Click on the tab labeled **Event Log**. The LINQ2 event log will open. This screen will display the event log along with the heartbeat timer setup.

Event Log:
The event log will display the 50 most recent events. To update the Event Log click the button labeled **Display/Refresh Log**. the most recent events will be displayed.

Heartbeat Timer:
The heartbeat timer will send a trap message indicating that the LINQ2 is still connected and communicating.

Setting the Heart Beat Timer *(Fig. 11, pg. 10)*:
1. Click the button labeled **Heartbeat Timer Setting**.
2. Select the desired time between heartbeat messaging in the Days, Hours, Minutes and Seconds in corresponding fields.
3. Click the button labeled **Submit** to save settings.

5- Updating Firmware:
Firmware updates must be done using the Altronix Dashboard. For additional information refer to the Updating firmware / SSL certificate and Key section in the Altronix Dashboard setup/user manual.

Fig. 10

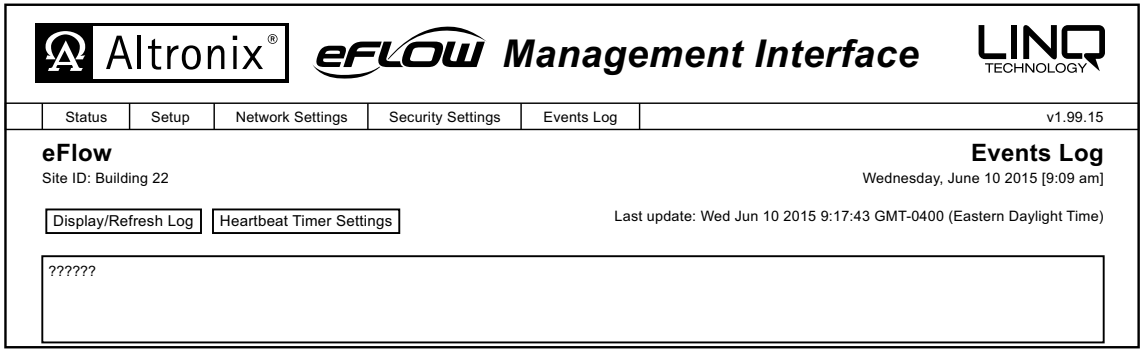
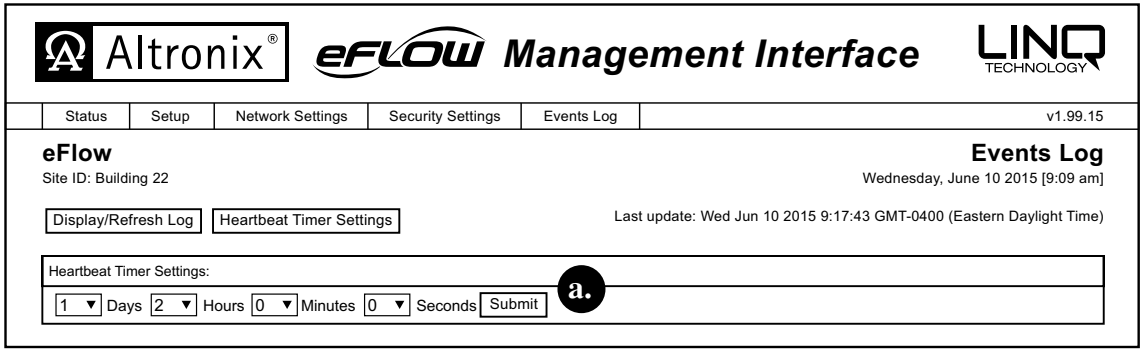


Fig. 11



Notes:

Notes:

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